

Math 3C Fall 2014
Pre-lecture 8-1 Due: Beginning of lecture-Monday, November 24.

This is to be done on your own paper. Please write your name (last name first) on the top right corner along with your discussion section number (B02, B03 etc) and “pre-lecture [number]” (in this case “pre-lecture 8-1”).

This will be graded on effort and thoughtfulness, not on correctness. With that said, do not feel obligated to write more than necessary. This is intended for you to work on your own.

All units on this assignment will be in radians, not degrees.

1. Recall that for every angle θ , there is a corresponding point on the unit circle. For example, the angle 0 corresponds to the point $(1, 0)$ while the angle $\pi/4$ corresponds to the point $(\sqrt{2}/2, \sqrt{2}/2)$.

Define the function $f(\theta)$ to give the x -coordinate of the point on the unit circle corresponding to the angle θ . For example $f(0) = 1$ and $f(\pi/4) = \sqrt{2}/2$.

- (a) What is $f(\pi/3)$? How about $f(\pi/2)$? What about $f(\pi/6)$? (Hint: Draw the unit circle and use triangles to figure out what these values are if you are having trouble. Remember, you can always convert to degrees if you are having trouble remembering what certain angles in radians are)
- (b) Now make a table of values for $f(\theta)$. It should start out like

θ	$f(\theta)$
0	1
$\pi/6$	$\sqrt{3}/2$
\vdots	\vdots

You should include all values of θ from 0 to 2π which are either multiples of $\pi/6$

(So numbers like $0\pi/6 = 0$, $1\pi/6 = \pi/6$, $2\pi/6 = \pi/3$, $3\pi/6 = \pi/2$, $4\pi/6 = 2\pi/3$, $5\pi/6$, $6\pi/6 = \pi$, $7\pi/6$, ...)

or multiples of $\pi/4$

(So numbers like $0\pi/4 = 0$, $1\pi/4 = \pi/4$, $2\pi/4 = \pi/2$, $3\pi/4$, $4\pi/4 = \pi$, $5\pi/4$, $6\pi/4 = 3\pi/2$, $7\pi/4$, ...)

Therefore the θ column should start out 0, $\pi/6$, $\pi/4$, $\pi/3$, $\pi/2$, $2\pi/3$, ...)

- (c) By either drawing the unit circle or by examining your table, for what values of θ in the interval $[0, 2\pi]$ is $f(\theta)$ positive? Write your answer in interval notation.
- (d) By either drawing the unit circle or by examining your table, for what values of θ in the interval $[0, 2\pi]$ is $f(\theta)$ negative? Write your answer in interval notation.
2. Now repeat all of the steps of 1 (a)-(d) with the function $g(\theta)$ where $g(\theta)$ is the y -coordinate of the point on the unit circle corresponding to θ . (So $g(0) = 0$ and $g(\pi/4) = \sqrt{2}/2$ for example).